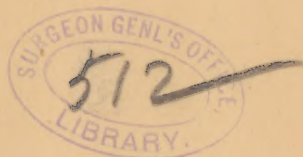


Kiliani (O. G. J.)

Sterilized catgut in a
convenient and portable form.



Sterilized Catgut in a Convenient and Portable Form.

By OTTO G. T. KILIANI, M. D.,

NEW YORK,

INSTRUCTOR IN CLINICAL SURGERY IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL;
SURGEON TO THE GERMAN DISPENSARY.

SURGERY in its present state of development is surely a great science and a great art. But the more elaborate our methods grow, and the better our technique becomes, the more does our success depend upon very small and apparently unimportant details. This is one of the reasons why I venture to bring to your notice to-night this little arrangement which is the subject of my paper.

One of the most important features of surgical technique is the material for sutures and ligatures, and its preparation. In all the cases where we wish to use absorbable material—and it is used now in our aseptic period, where most of the operations are expected to heal under one dressing, a great deal more than ever before—catgut is the material; and it would be used still more if a good many surgeons had not lost faith in the possibility of sterilizing it. How important this question is, is shown by the fact that, for instance, I personally know of eighteen different methods of preparing catgut. There are very likely a great many more, in fact nearly every surgeon has his own method, or at least the "modified" method of somebody else. Now, it is a well known fact that wherever a great many methods exist for achieving the same thing, and wherever new methods are constantly being invented, none of the old ones is satisfactory, and I should like, therefore, to hear your opinion about my method.

In preparing catgut for surgical use three points come into consideration, namely: 1. How to sterilize catgut. 2. How to keep the sterilized catgut in this condition. 3. How to make it portable in that sterilized condition.

Without entering into particulars concerning other methods, I will briefly describe my own, and we will then see how it answers these three requirements.

Dry catgut, not kept in oil, is put in absolute alcohol for twenty-four hours to remove all moisture. Then it is cut in pieces of two and three yards length, one of which is rolled on a glass rod, and then put in a glass tube open at one end, and with a little hole at the other, through which a short end of catgut is pulled. The glass rod is removed and the roll of catgut is in the glass tube. This tube with its contents is put in a second glass tube, a little wider and longer, with one end open. Then the filled tube is put in a dry hot-air sterilizing apparatus, the temperature of which is brought within one hour up to 80 centigrade, 175° F. This is to let the alcohol evaporate, and what might be left of water. Then the open end is closed by melting the glass, and the hermetically sealed tube is again put into the sterilizing oven, the temperature of which is brought up in the course of two hours more to 140 centigrade, 284° F., which is kept up for a whole hour. Another hour is consumed in letting the temperature gradually sink again. Then the outer tube is scratched with a file and it is ready for use. Immediately before using it the outer tube is broken, as described below, at the marked place, and the inner tube with its contents put for two minutes into the solution in which the instruments are lying, whether it be carbolic acid solution or soda solution, or whatever else is used. Then you pull out through the little hole as much as you need, and so gradually use it up; or if all is not used, the rest is thrown away. This is a most essential point, that each tube contains only just about as much catgut as will be needed for an operation; for an extended operation several tubes may be opened in succession; and that then it cannot happen, as it does in other methods, that the remainder of the unused catgut becomes infected. This, of course, only holds good when the unused pieces are thrown away.

Our bacteriological experience has shown any number of times, and shows every day, that all micro-organisms and their spores are definitely destroyed by the temperature to which the catgut is subjected. It was really entirely unnecessary to prove it again, and I have done so only for the sake of completeness. I have here tubes with pieces of sterilized catgut in the gelatine or agar, where absolutely no cultures are to be seen. Some of them contain catgut as it is in the market and then sterilized, some catgut which I infected with pus or with cultures of staphylococcus pyogenes aureus and citreus, streptococcus, and anthrax, and then sterilized.

I have been making these experiments for over six months, and I never got a culture except sometimes by carelessness a non-pathogenic culture of asparagillus, the bacillus of mould.

But there is another question to be answered, and this is: Does sterilizing in dry heat not injure the catgut and impair its durability, elasticity, etc.? I am fortunately able to give a definite answer to this question.

Reverdin and Benkisser first employed this way of sterilizing catgut, and found out how not to injure the quality in the process. I do not know how much it came into general use, but Schede, surgeon to the new Hamburg State Hospital, had the catgut prepared in that way since 1889, and it was there, during my service in 1890, that I learned how to do it. Since that time I have had the method in constant use for my own work, and I never had reason to complain about it. So the experience of one of the largest hospitals in the world—Schede has six hundred surgical beds—speaks for it, besides my own experience. Now to the second point. How to keep sterilized catgut sterile. All sorts of ways have been tried to achieve this end, and every one knows the different glass jars and bottles in which the catgut is kept, on glass spools in alcohol, with or without salicylic acid, chromic acid, carbolic acid, iodoform, bichloride, etc.

In my method of preparation it is beyond any doubt that the catgut, if it ever becomes sterile, must remain so forever in the glass tube which has been closed by melting. And it seems to me to be a very important feature that the catgut is contained in a hermetically closed tube during sterilization, and therefore is absolutely safe from infection of any kind by handling, during or after the process.

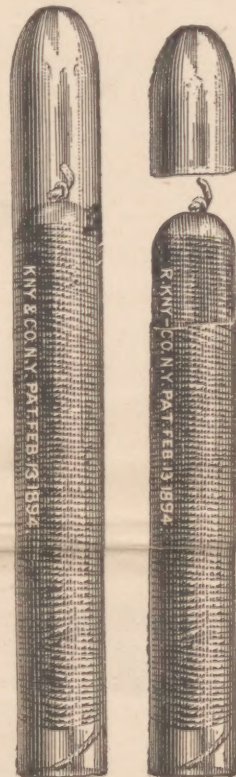
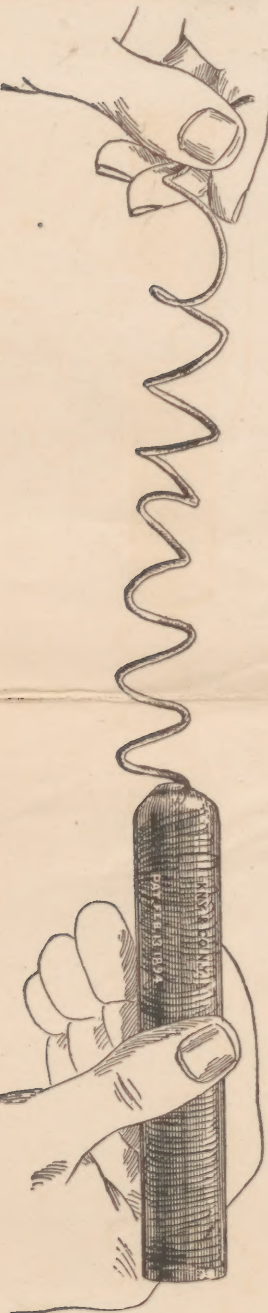
The last point to be investigated is the convenience in carrying around. A great number of receptacles have been constructed and recommended, a part of which I have tried myself and found them all unsatisfactory. The reason is plain, as, first, in all of them the catgut must be kept in a fluid, and, secondly, these must all be refilled. I think this is the strongest point in favor of my preparation. Nothing can be easier and more convenient and handier than these little tubes. There is nothing to run out or spill, with reasonable care there is nothing to break, there is nothing to get out of order, and they are always ready for use.

It only remains for me to mention that the preparation will be very cheap, a point which will have some bearing on its use for general practice. It is intended specially for the general practitioner, and not only for the surgeon, whose operations are for the greater part performed in the hospital, where he can keep his catgut the way he prefers, or can have it sterilized according to his own liking.

For this purpose the firm of Richard Kny & Co., 17 Park Place, New York, who are prepared to furnish this catgut, will also sell it unsterilized with the outer tube open, according to a suggestion made by Dr. Gerster when I spoke with him about it. It can then be easily closed by a wad of cotton instead of by melting the glass.

I know of only one objection which can be urged against the use of this preparation, viz.: that it is impossible to see whether the catgut is really sterilized. In this respect we have to trust to the makers, except that, as a further precaution, some specimens of each lot of sterilized catgut should be subjected to bacteriological tests before being put on sale.

It gives me great pleasure in conclusion to give credit to Dr. Francis Foerster, whose suggestion was the incentive in my attempt to perfect a portable form of dry-sterilized catgut, which I hope may prove of some practical value to the profession.



1. The outer tube is broken as follows: A small piece of wire comes with each lot of tubes, it is heated red-hot in the flame of a spirit or other lamp, and on being placed upon the file-mark, cracks the glass cleanly. Or the tube can be easily broken between the fingers without danger of lesion, by wrapping some sterilized gauze around it.

Prices of Dr. Kiliani's Dry Sterilized Catgut, in Hermetically Closed Glass Tubes.

In 2-yard lengths, No. 2.....	\$1.70	In 3-yard lengths, No. 2.....	\$2.10
" " " 4.....	1.85	" " " 4.....	2.35
" " " 6.....	2.15	" " " 6.....	2.65

RICHARD KNY & CO.,

MANUFACTURERS AND IMPORTERS OF

Surgical Instruments, Aseptic Operating Furniture and Surgical Glassware,
17 PARK PLACE, NEW YORK.

